



# Perennial Streams Identification and Mapping Project, Fairfax County, VA

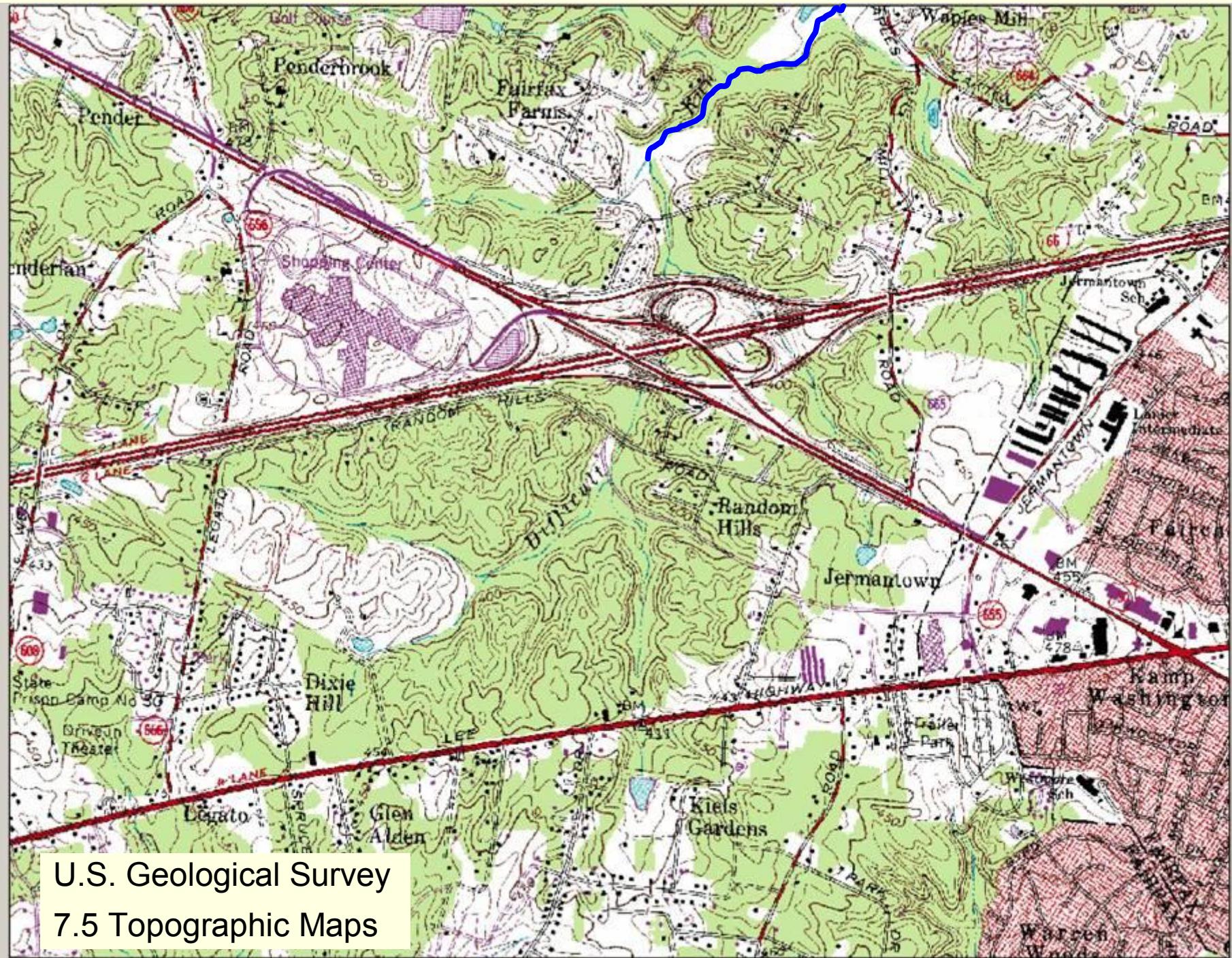
**Project Overview  
October 21, 2003**

**Matt Meyers  
Stormwater Planning Division  
Department of Public Works and Environmental Services**

# Background

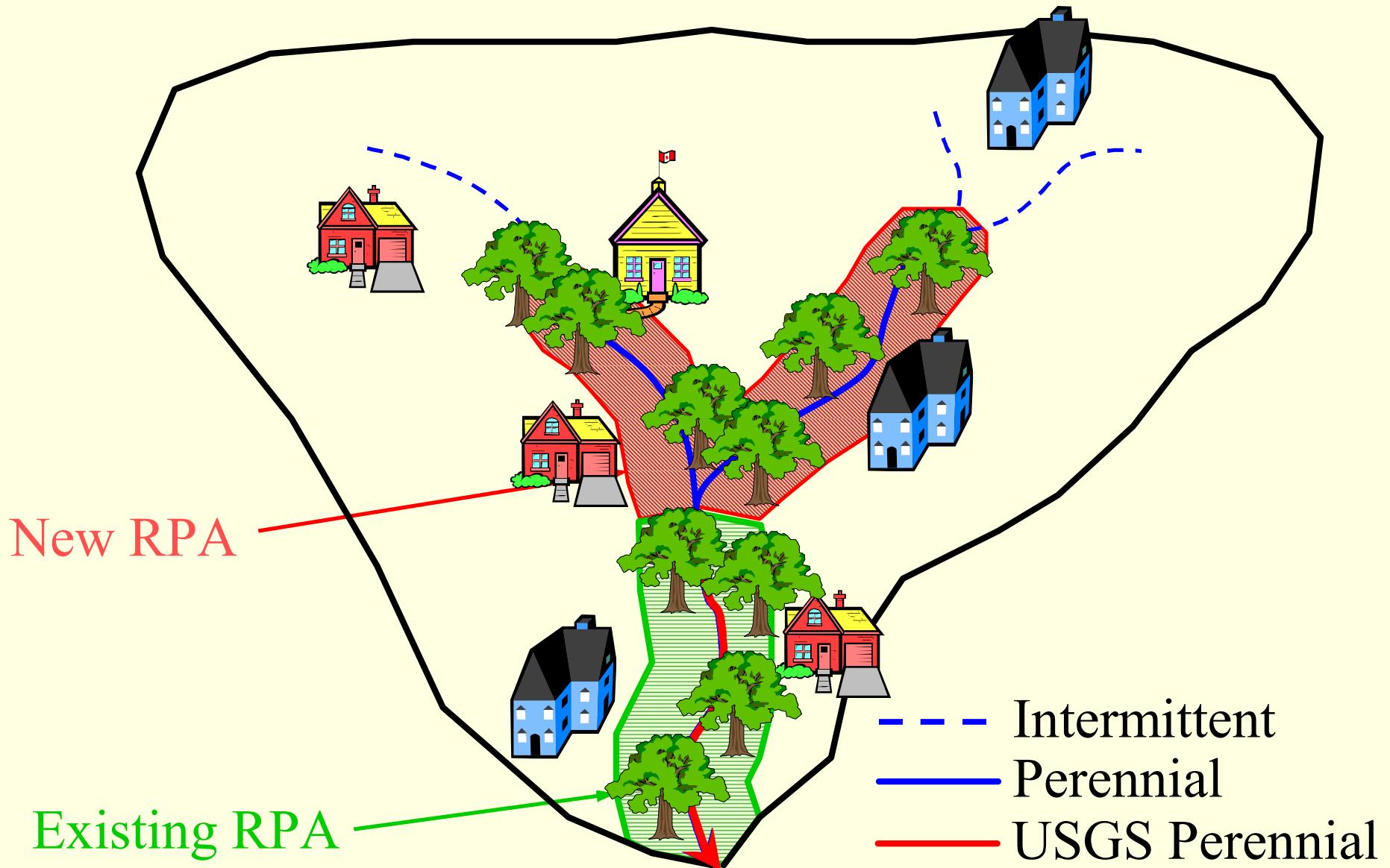
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- Environmental Quality Advisory Council's (EQAC) letter and resolution regarding mapping flaws in the U.S. Geological Survey (USGS) maps which are used to identify perennial streams.
- Perennial streams not depicted on the USGS 7.5 minute quadrangle maps are not afforded protection under the County's Chesapeake Bay Preservation Ordinance, Chapter 118 of the Fairfax County Code.



U.S. Geological Survey  
7.5 Topographic Maps

# Resource Protection Areas



# Project Goals and Objectives

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- Identify and map perennial streams
- Update stream GIS data layer
- Characterize and inventory headwater streams
- Support CBPO amendment
  - Develop CBPA maps
  - Review On-site determinations



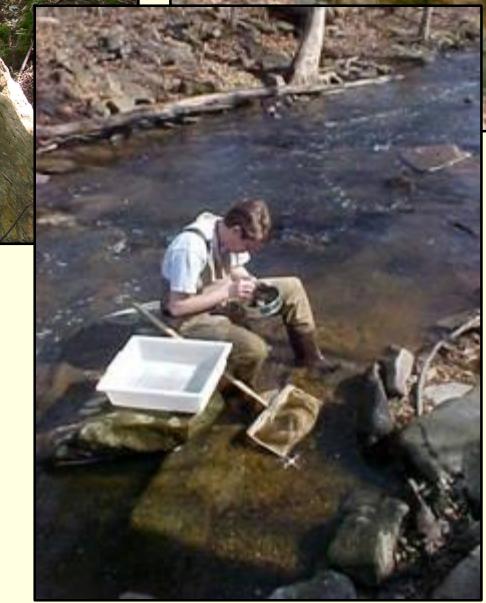
# Project Timeline

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- September 2001: BOS project approval
- Fall 2001: Pilot project
- December 2001: **State regulations adopted**
- March 2002: Countywide field surveys started
- March 2002: **State regulations became effective**
- May 2003: Interim Guidance Map – First Draft
- July 2003: County's CBPO adopted
- November 2003: County's CBPO becomes effective

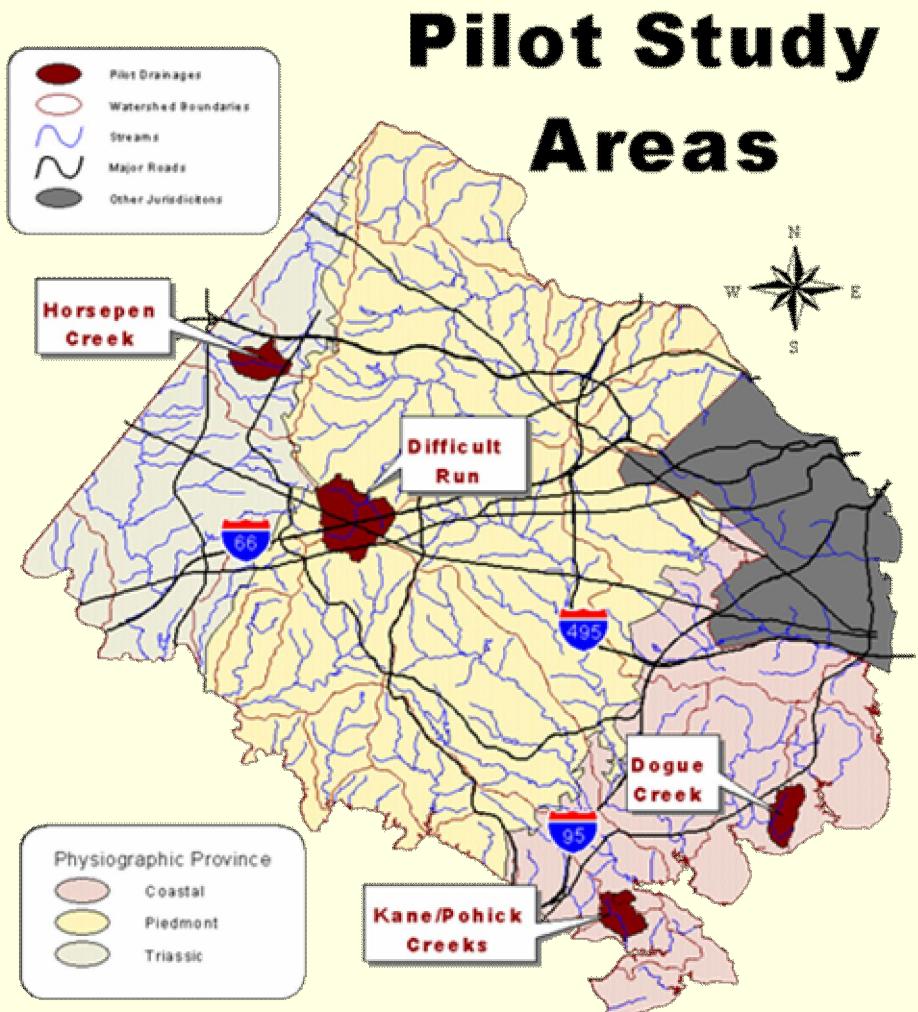
# Staffing

- Stream Protection Strategy Team
  - 6 Staff – 3 teams
  - Summer Interns



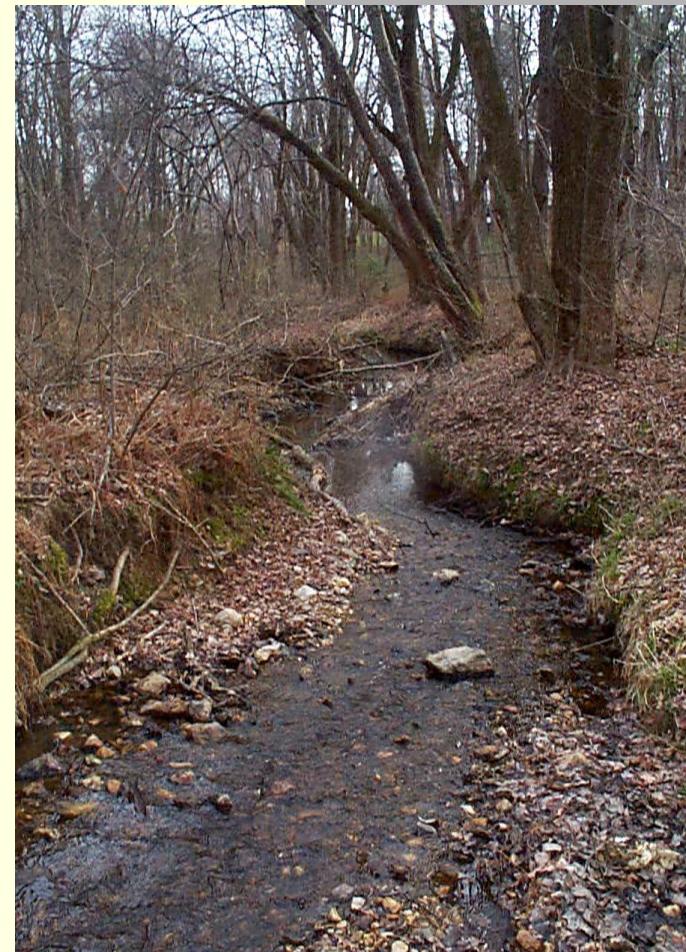
# Protocol Development

- Literature Review
- Technical Advisory Group
- Pilot Project
  - Five subwatersheds
  - Three physiographic regions
- TAG Final Review



# Stream Classification Protocols

- Hydrology
  - stream flow
  - seeps and springs
- Geomorphology
  - Degree of channel formation
  - streambed Soils
  - sinuosity
- Biology
  - vegetation
  - benthic macroinvertebrates
  - vertebrates



<http://www.fairfaxcounty.gov/gov/DPWES/Watersheds/perennial.htm>

# Fairfax County Protocol Datasheet

Site ID:	Total Score:
----------	--------------

Date: \_\_\_\_\_ Recorder: \_\_\_\_\_  
Time: \_\_\_\_\_ Evaluators: \_\_\_\_\_

## Field Indicators:

I.) Streamflow and Hydrology	Absent	Weak	Moderate	Strong
1.) Presence or absence of flowing water and > 48 hrs since last rainfall	0	1	2	3
2.) Presence of high groundwater table or seeps and springs	0	1	2	3
3.) Leaffilter in streambed	1.5	1	0.5	0
4.) Drift lines	0	0.5	1	1.5
5.) Sediment on debris or plants	0	0.5	1	1.5

Total Streamflow and Hydrology

II.) Geomorphology	Absent	Weak	Moderate	Strong
1.) Riffle-pool sequence	0	1	2	3
2.) Substrate Sorting (USDA texture in streambed)	0	1	2	3
3.) Natural Levees	0	1	2	3
4.) Sinuosity	0	1	2	3
5.) Active or Relic Floodplain	0	1	2	3
6.) Braided Channel	0	1	2	3
7.) Recent Alluvial Deposits	0	1	2	3
8.) Bankfull Bench present	0	1	2	3
9.) Continuous Bed and Bank	0	1	2	3
10.) 2nd order or greater channel	0	1	2	3

Total Geomorphology Points:

III.) Streambed Soils	Absent	Weak	Moderate	Strong
1.) Redoximorphic features pres or head cut.	0	1	2	3
2.) Chroma	0	1	2	3

Total Streambed Soils Points:

IV.) Vegetation	Absent	Weak	Moderate	Strong
1.) Rooted AQUATIC Plants in Streambed	0	1	2	3
2.) Presence of Periphyton/green algae	0	1	2	3
3.) Iron Oxidizing Bacteria/Fungus	0	0.5	1	1.5
4.) Wetland Plants in Streambed (Skip if no plants present in streambed)	SAV = 3	Mostly OBL = 1.5	Mostly FACW = 1	Mostly FAC = 0.5
				Mostly FACU, UPL, or None = 0

Total Vegetation Points:

Comments:
-----------

V.) Benthic Macroinvertebrates	Absent	Weak	Moderate	Strong
1.) Benthic Macroinvertebrates	0	0.5	1	1.5
2.) Bivalves	0	1	2	3
3.) EPT taxa	Present = 3			Absent = 0

Total Benthic Macroinvertebrates Points: \_\_\_\_\_

VI.) Vertebrates	Absent	Weak	Moderate	Strong
1.) Fish	0	0.5	1	1.5
2.) Amphibians	0	0.5	1	1.5

Total Vertebrates Points: \_\_\_\_\_

Total Score:
--------------

II.) Geomorphology	Absent	Weak	Moderate	Strong
1.) Riffle-pool sequence	0	1	2	3
2.) Substrate Sorting (USDA texture in streambed)	0	1	2	3
3.) Natural Levees	0	1	2	3
4.) Sinuosity	0	1	2	3
5.) Active or Relic Floodplain	0	1	2	3
6.) Braided Channel	0	1	2	3
7.) Recent Alluvial Deposits	0	1	2	3
8.) Bankfull Bench present	0	1	2	3
9.) Continuous Bed and Bank	0	1	2	3
10.) 2nd order or greater channel present	Yes = 3			No = 0

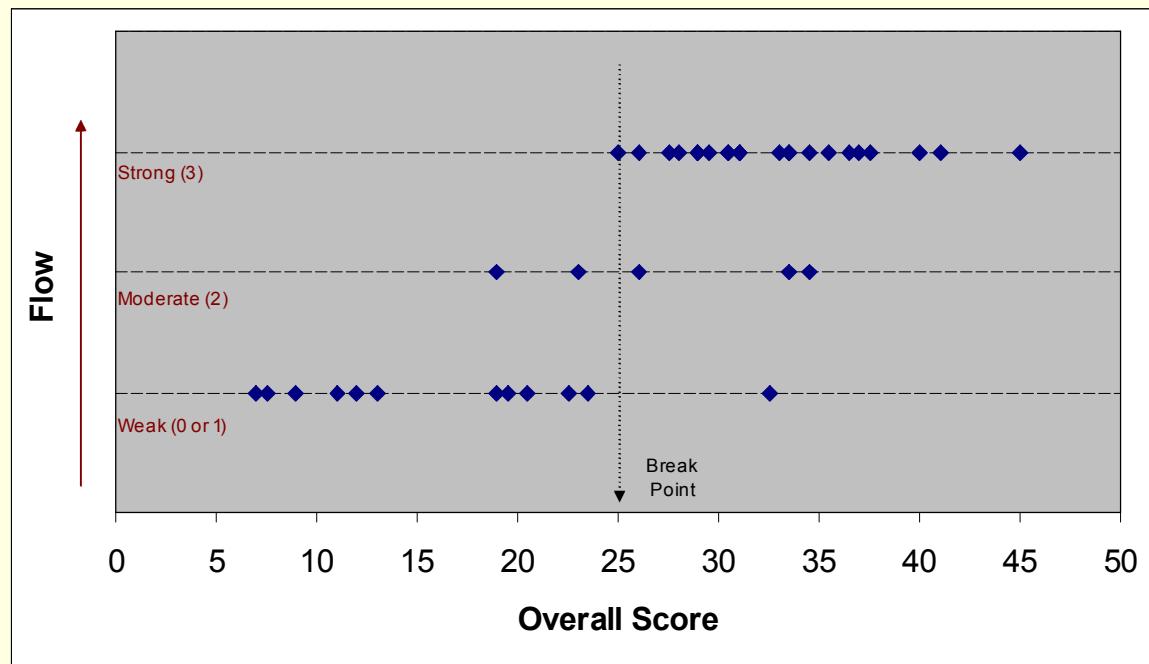
Other Observations and Comments:

Is the reach perennial? YES NO

Photo #	Direction (US, DS, LB, RB)	Notes

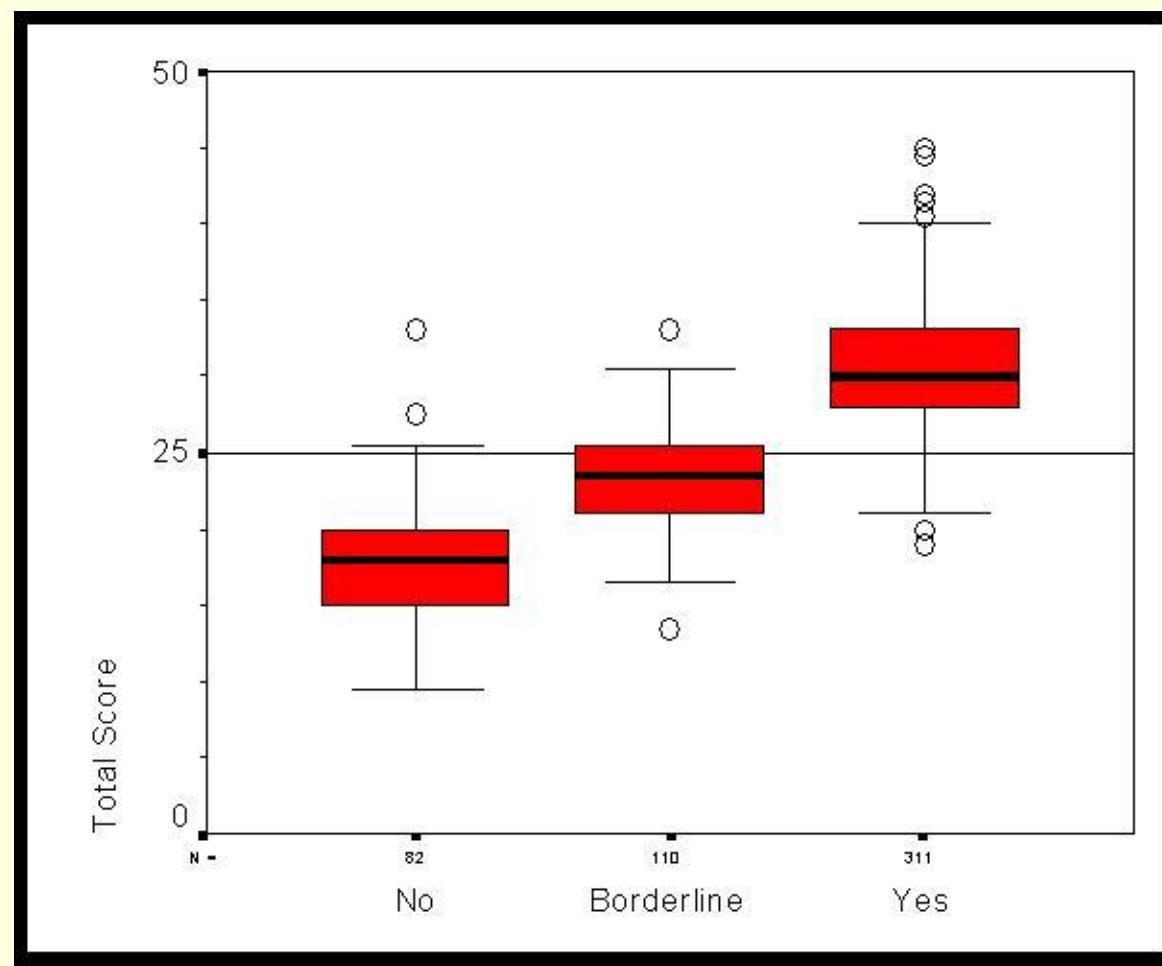
# What Score is Perennial?

- Pilot Study Results
  - Presence of flow
- Revisited some pilot study sites at end of hydrologic drought.



# What Score is Perennial?

## Summary of First Year's Results



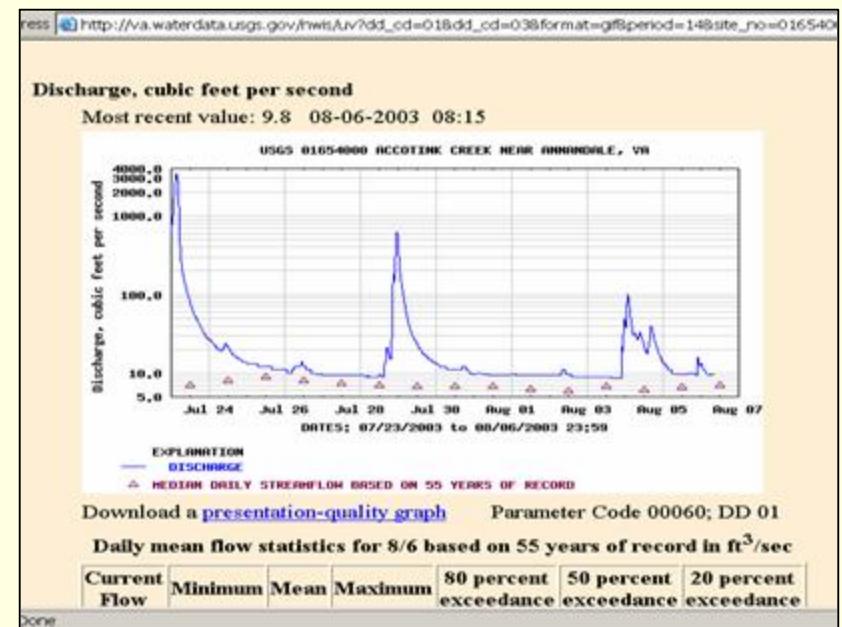
# A Day in the Life...

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# Rainfall and Stream Flow Information

- NBC 4 Four Winds (past 72 Hours)  
<http://www.nbc4.com/weather>
- USGS Stream Gauge at Accotink Creek  
<http://waterdata.usgs.gov/va/nwis/uv?01654000>



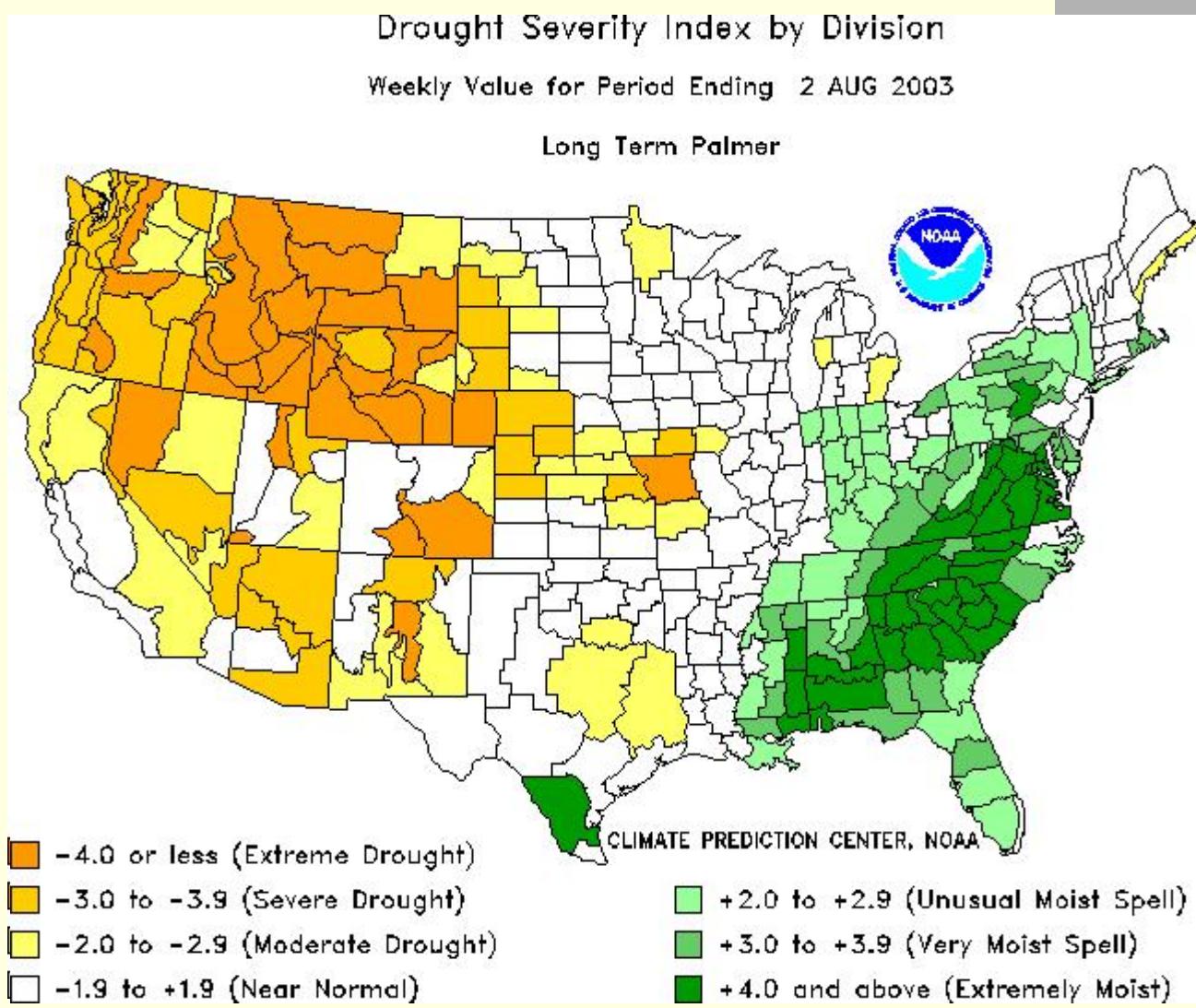
# Rainfall Information

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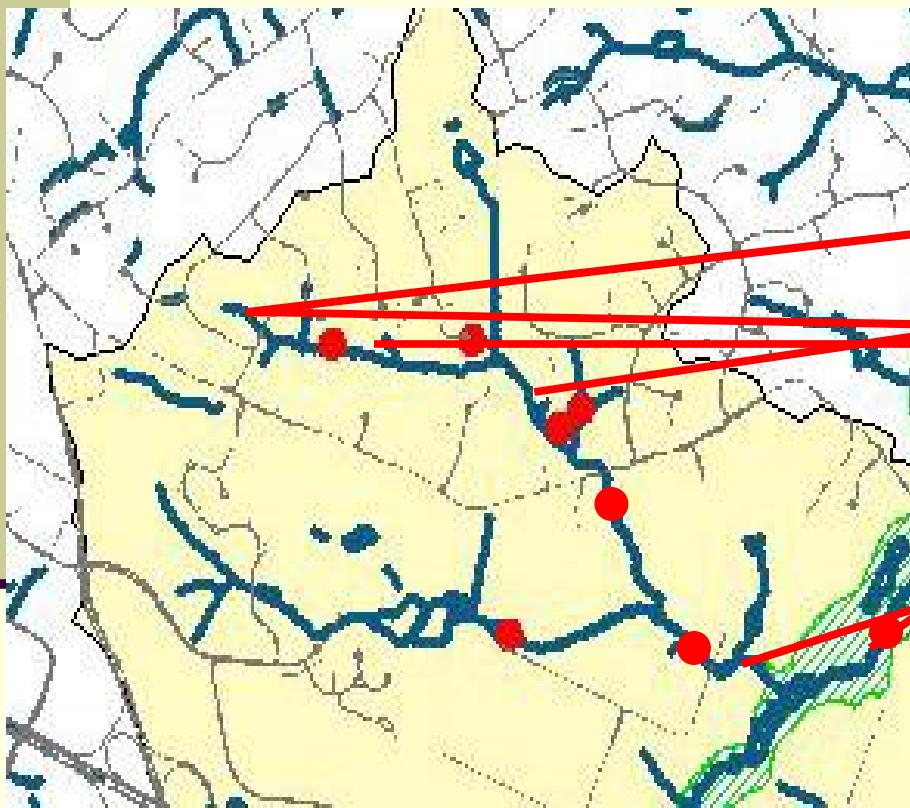
- NOAA/NWS (past 24 Hours)
  - Dulles International Airport  
<http://weather.noaa.gov/weather/current/KIAD.html>
  - Reagan National Airport  
<http://weather.noaa.gov/weather/current/KDCA.html>



# Weather



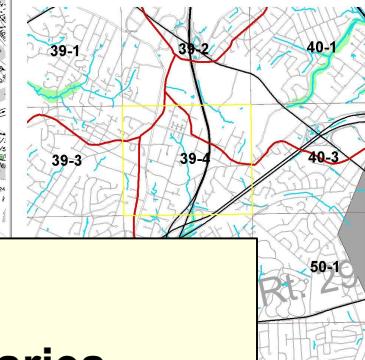
# Difficult Run Stream Walk



# Streams Act as a Continuum



# Cameron Run Tax Grid 39-4



**Site Code**  
**Reach Boundaries**  
**Photo Documentation**  
**Features**

Scale 1" = 250'



250 0 250 500 750 1000 Feet



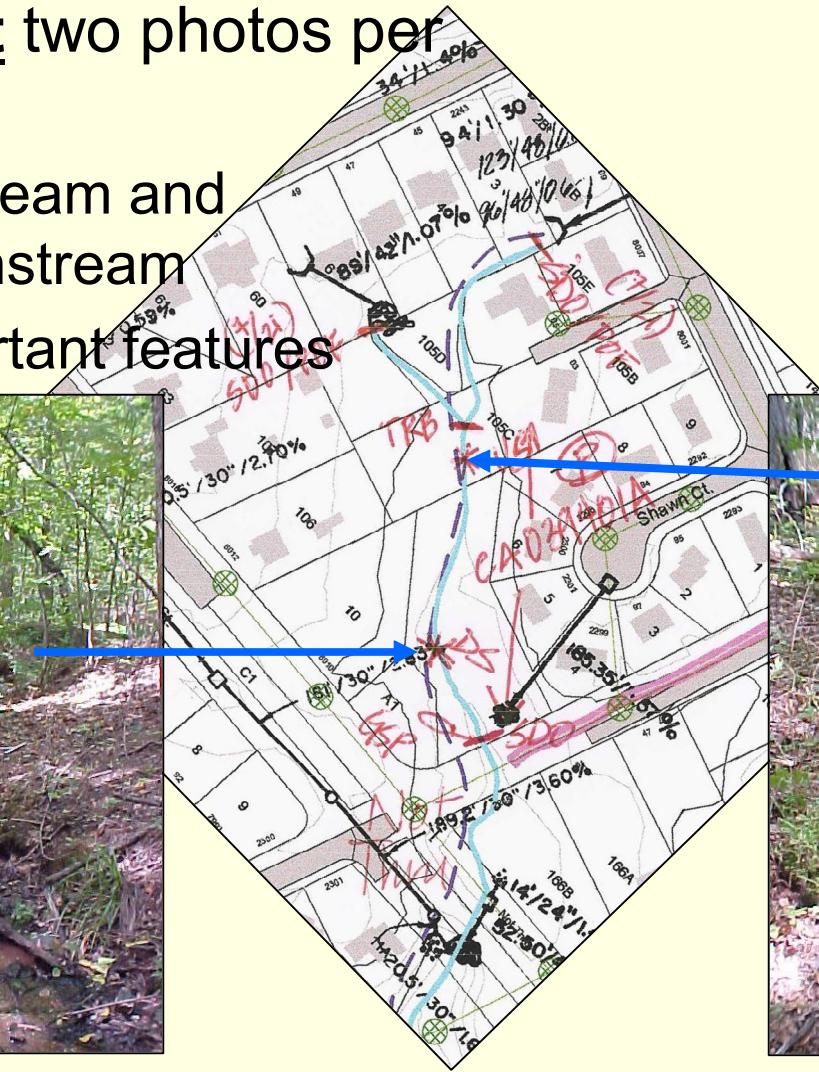
Stormwater Management Branch  
Stormwater Planning Division  
Department of Public Works and Environmental Services  
(703) 324-6500



# Photo Documentation

- **At least** two photos per site

- Upstream and Downstream
- Important features

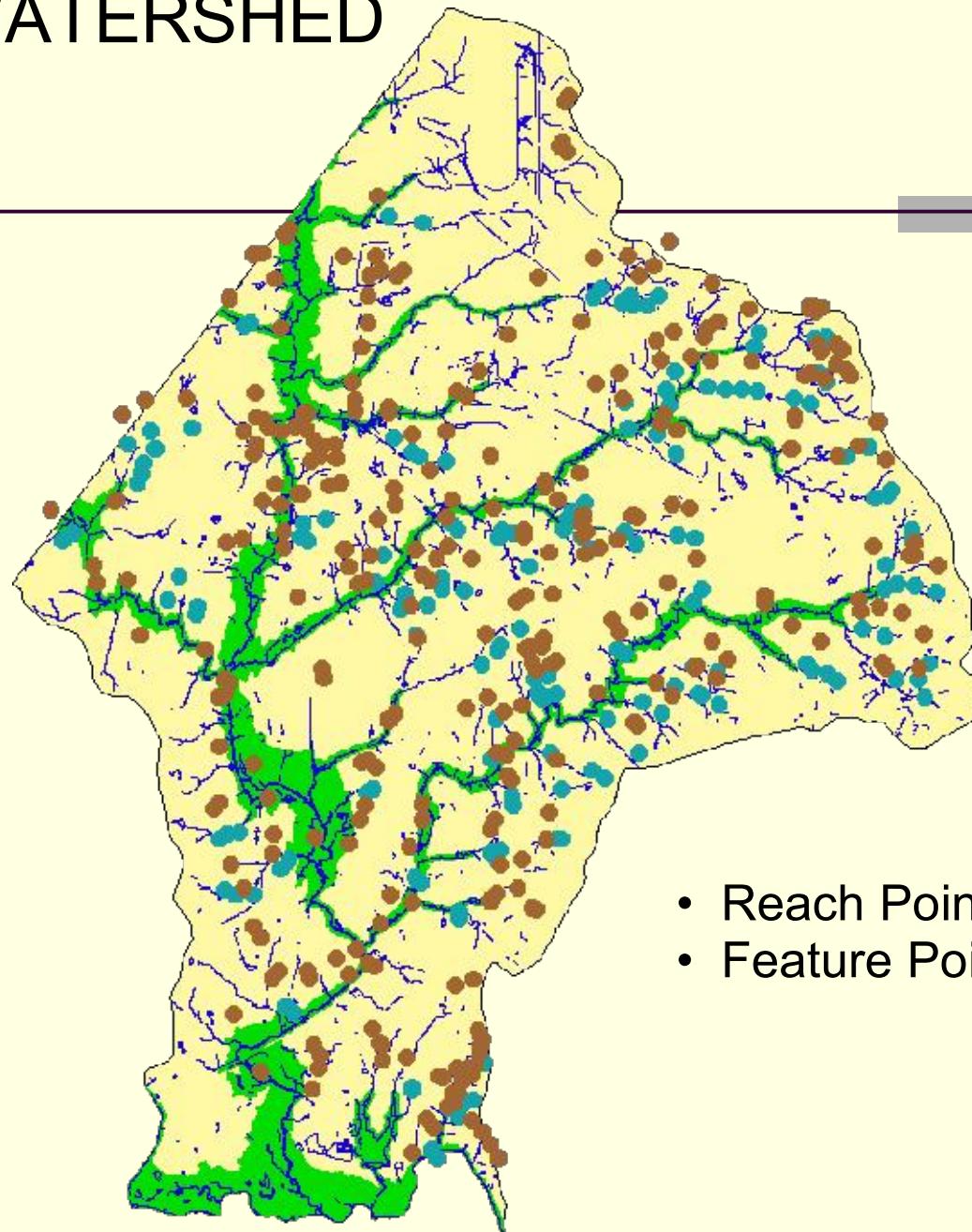


# Score Interpretation

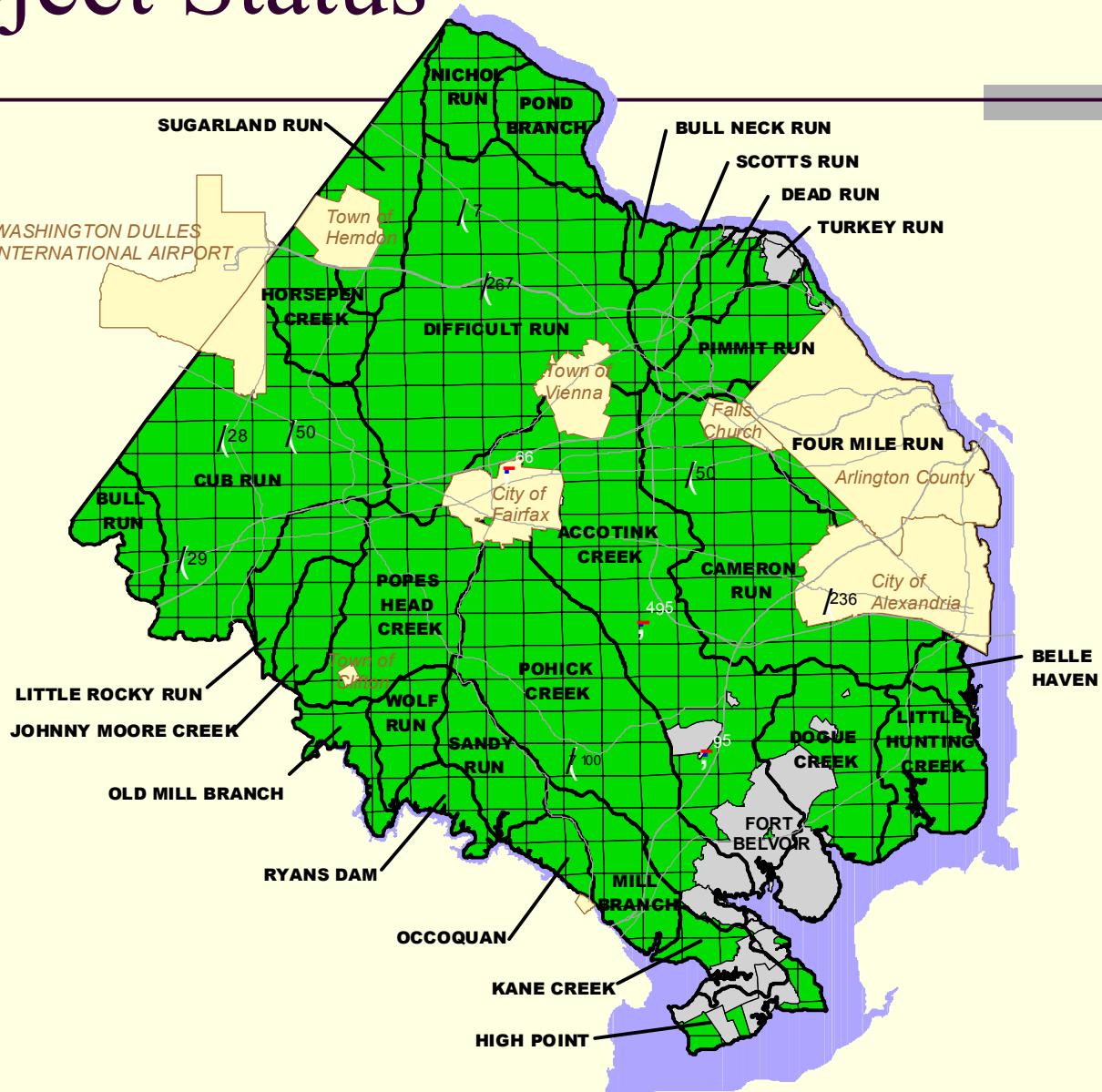
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- Overall determination is based on:
  - The total score
  - Supporting information
    - Biological indicators - EPT Taxa
    - Soil Survey
    - Resident at ----- said this stream dries up during the summer
    - Observational documentation
  - Best Professional Judgment
- Continue surveying downstream until a reach receive a minimum score of 28.

# CUB RUN WATERSHED



# Project Status



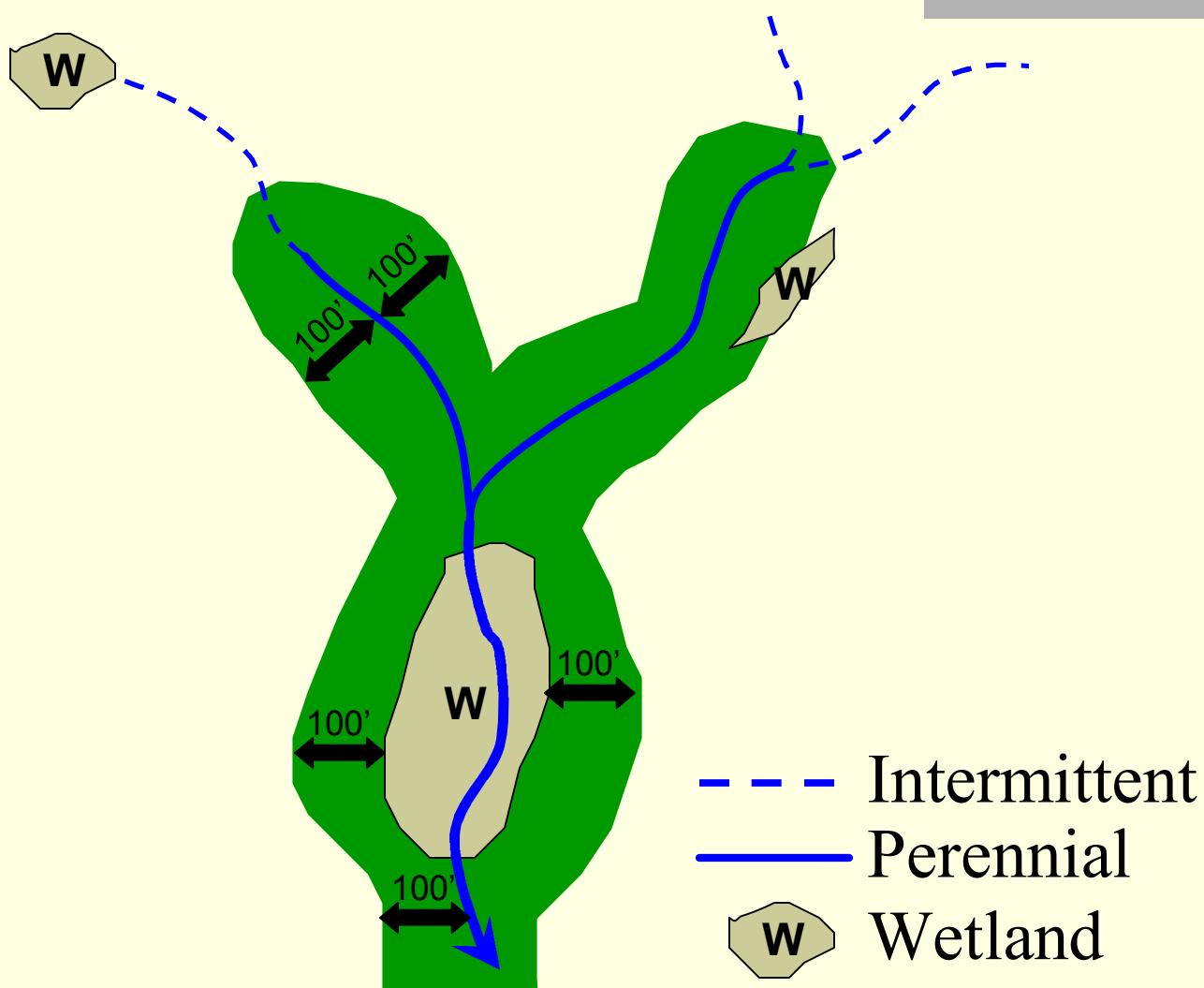
# Resource Protection Areas (RPAs)

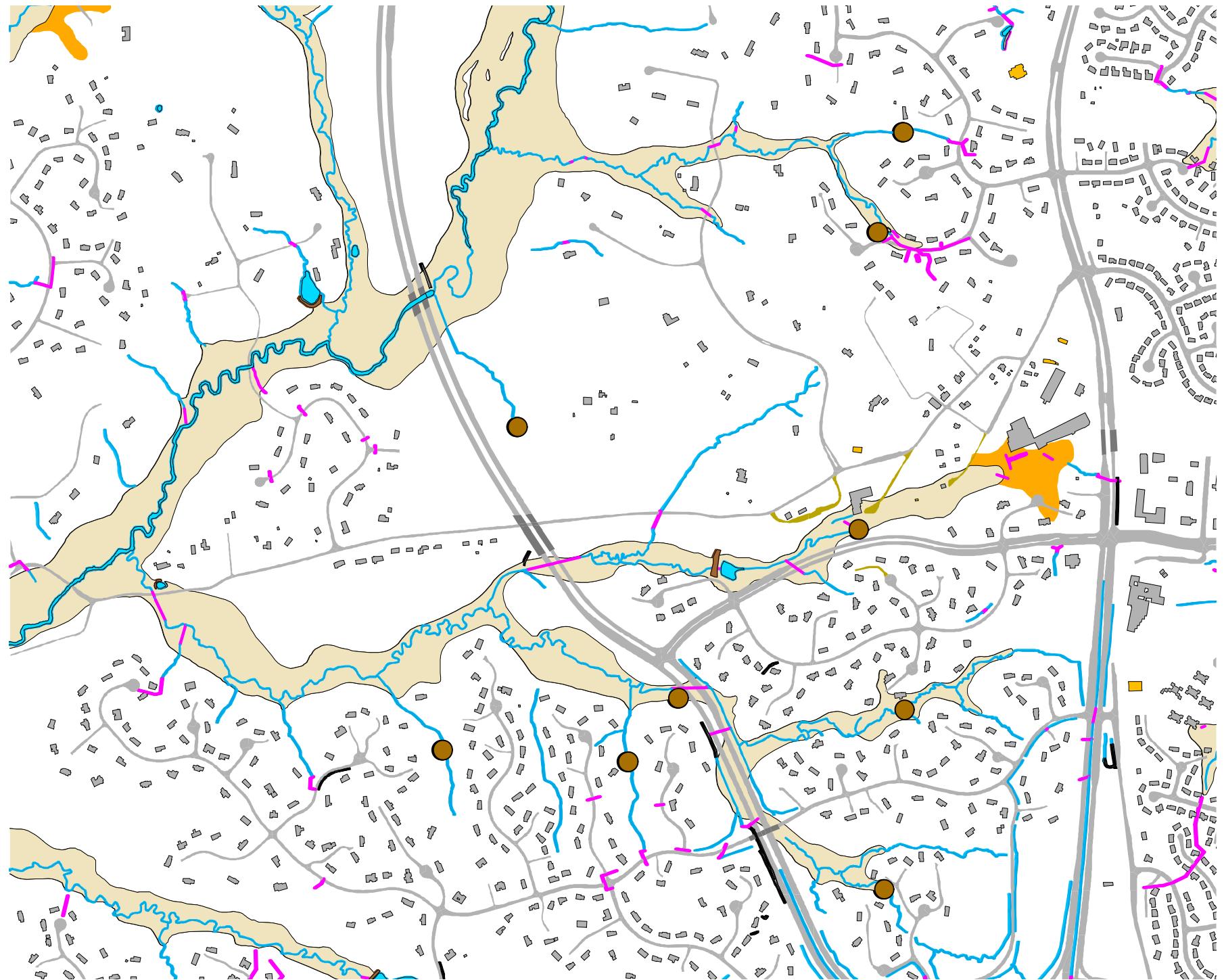
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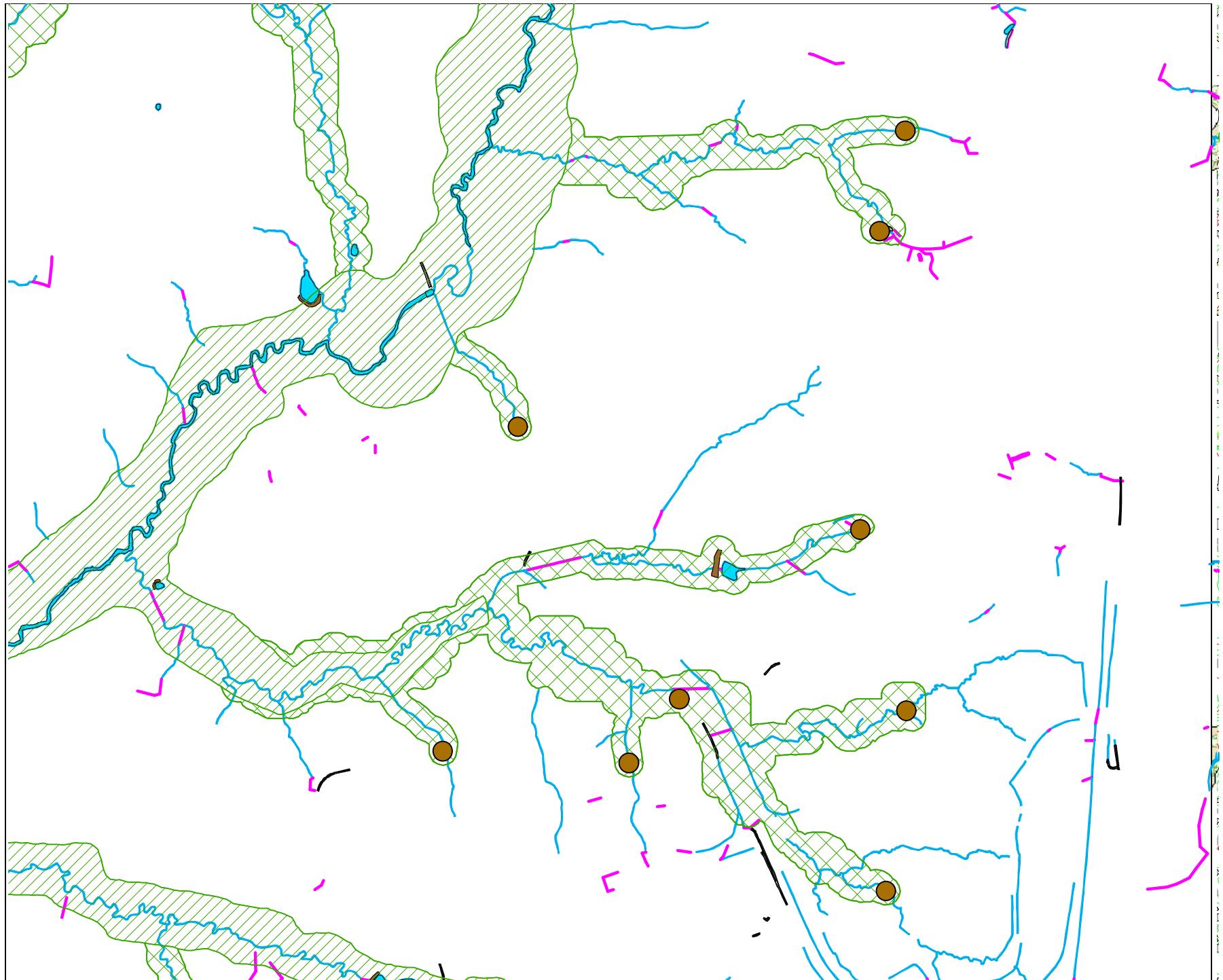
*RPAs shall include any land characterized by one or more of the following features:*

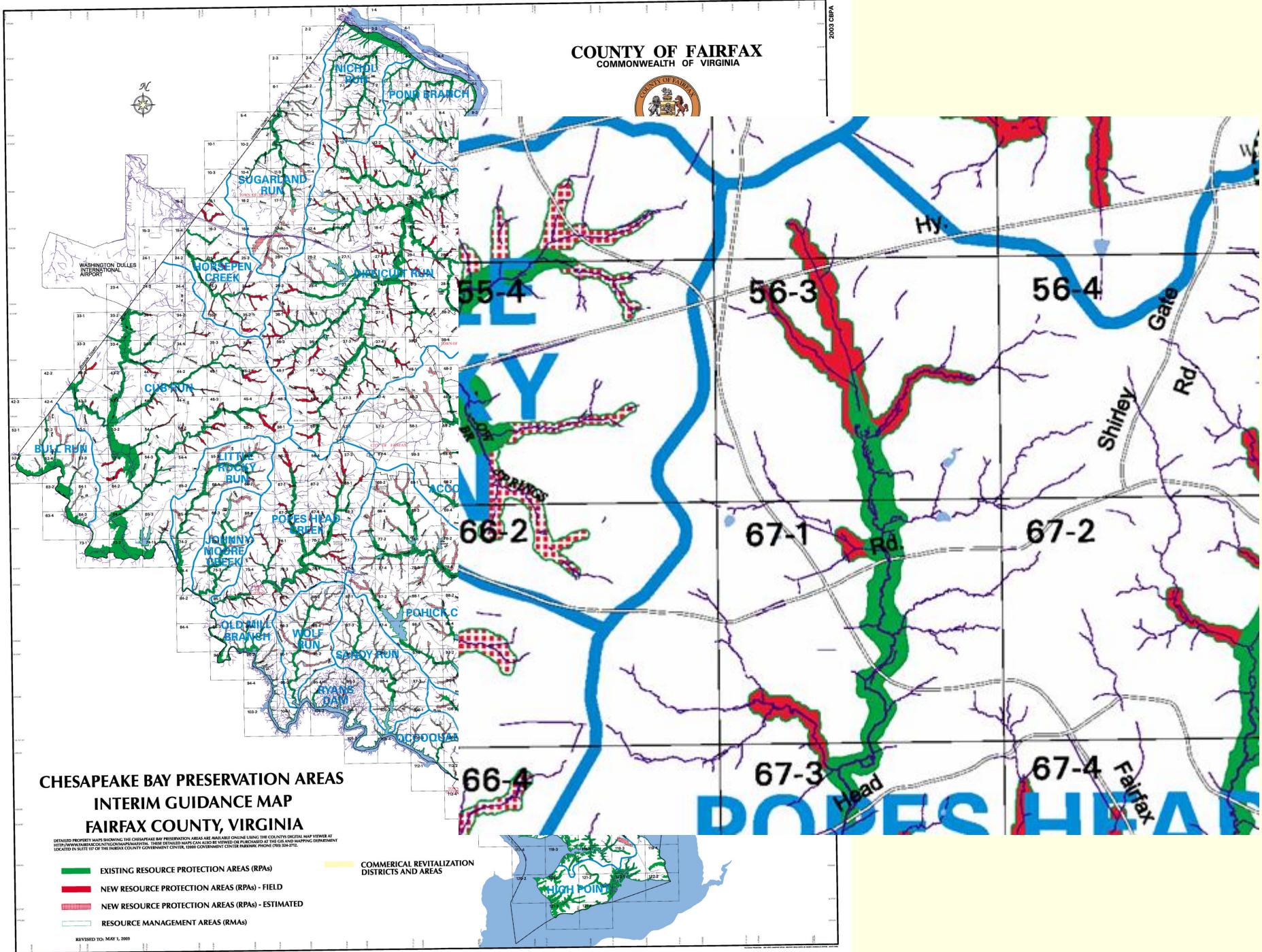
- (1) *A tidal wetland;*
- (2) *A tidal shore;*
- (3) *A water body with perennial flow;*
- (4) *A nontidal wetland connected by surface flow and contiguous to a tidal wetland or water body with perennial flow;*
- (5) *A buffer area as follows:*
  - (i) *Any land within a major floodplain;*
  - (ii) *Any land within 100 feet of a feature listed in Sections 118 1 7(b)(1)*

# Resource Protection Areas











200 FEET

Men's 15° NUTM Grid (USGS 1:24,000 scale)  
7.5 minute Quad. Virginia Coordinate System  
National Geodetic Vertical Datum 1988  
NAD 83 High Precision GPS Network Adjustment

National Geodetic Vertical Datum 1999

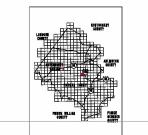
#### GENERAL NOTES

#### CHESAPEAKE BAY PRESERVATION AREA

LEGEND
Resource Protection Areas (RPAs)
Rotating RPAs
New RPAs
Resource Management Areas (RMAs)

Revised to 10/20/2003

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69-2	70-1	70-2
69-4	70-3	70-4

SHEET INDEX

#### PROPERTY MAP

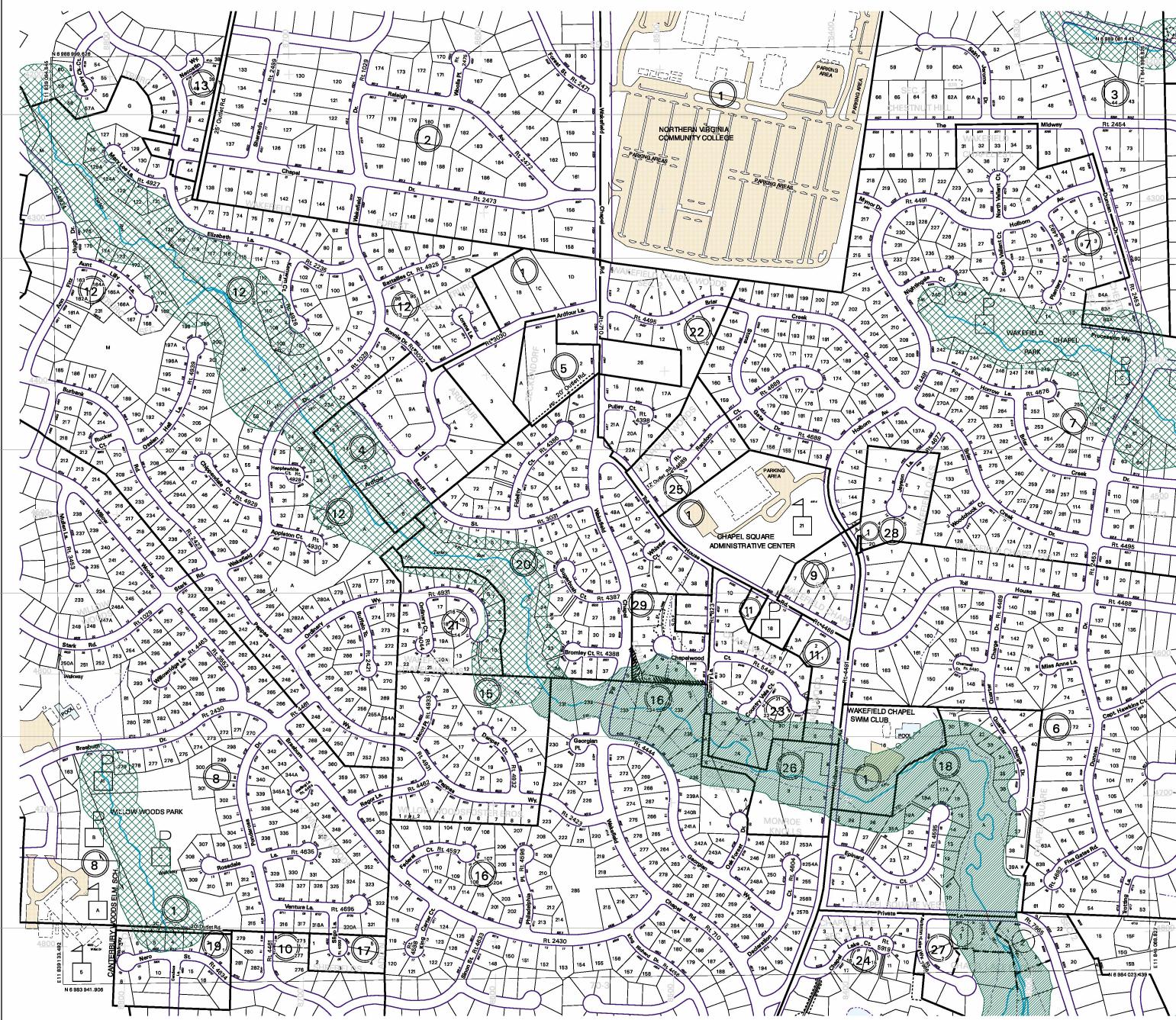
70-1

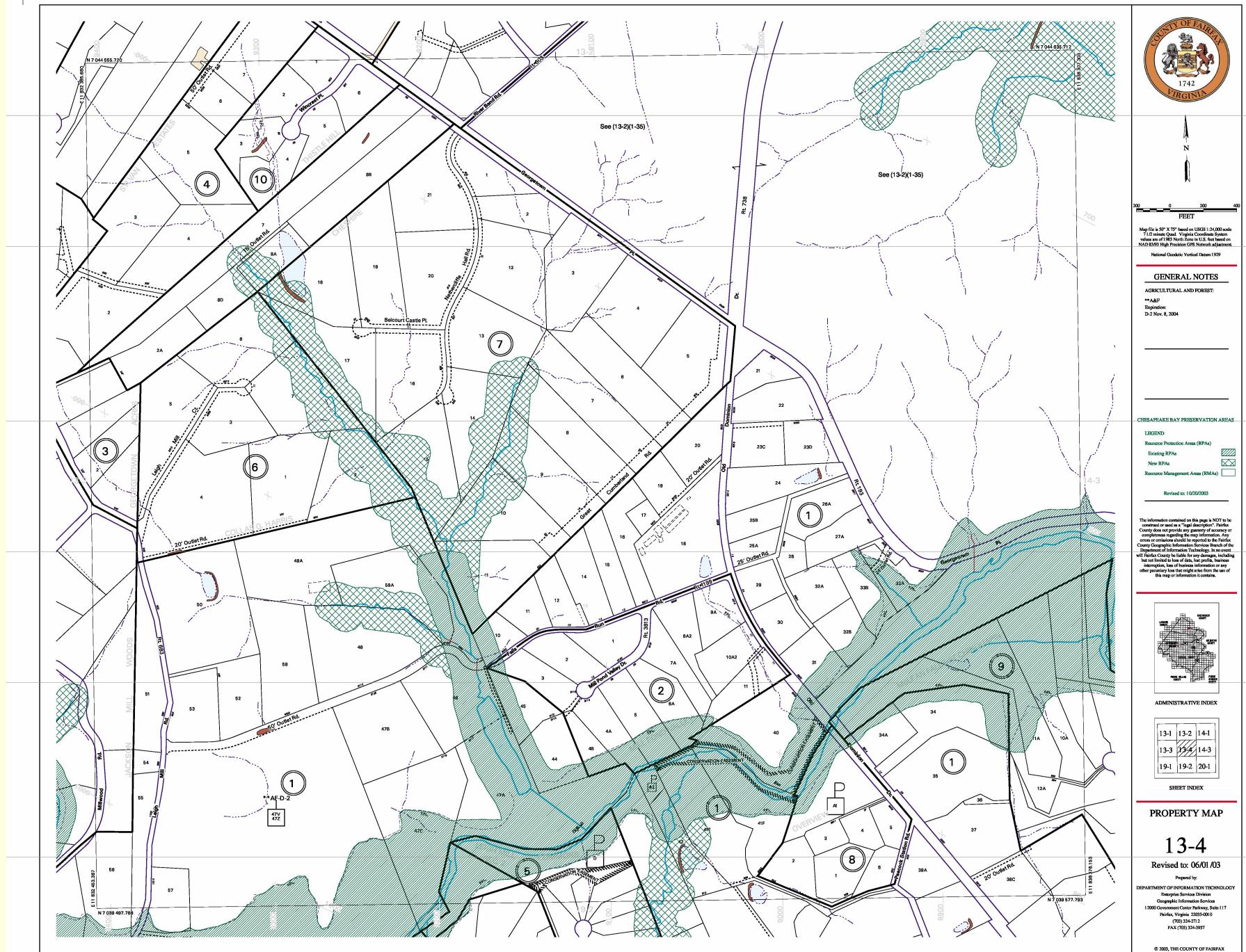
Revised to: 06/01/03

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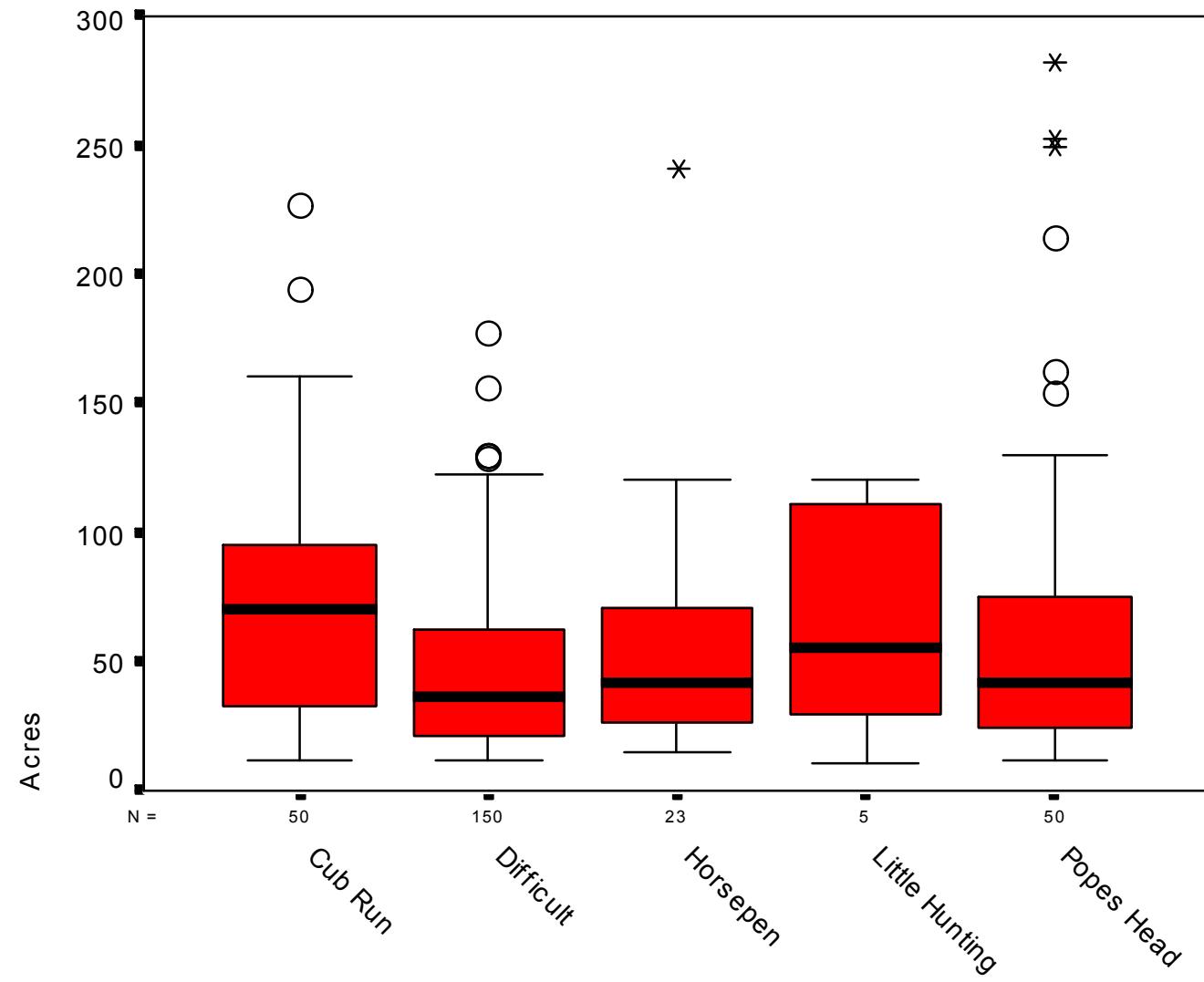


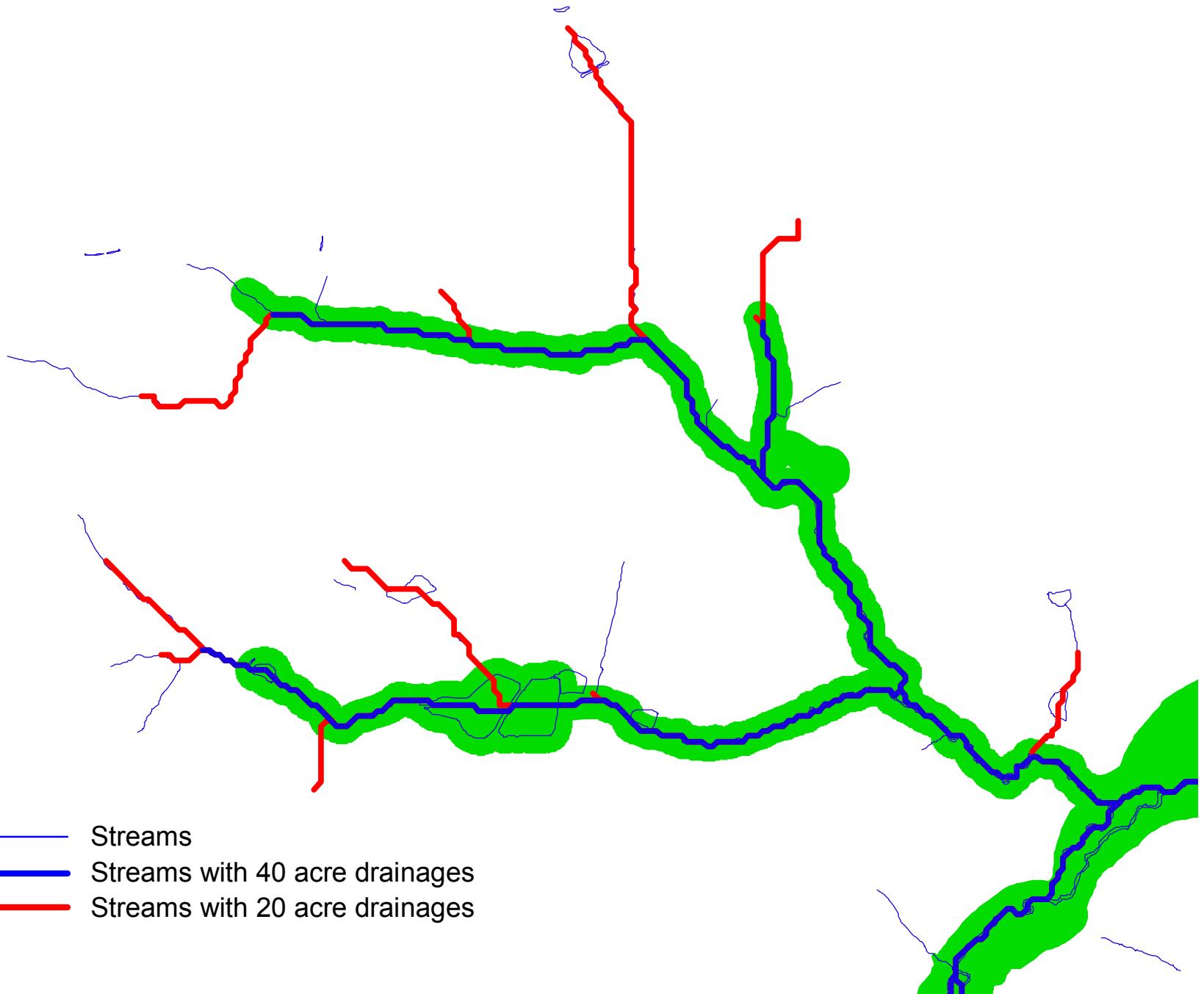
# CBPO Amendment Support

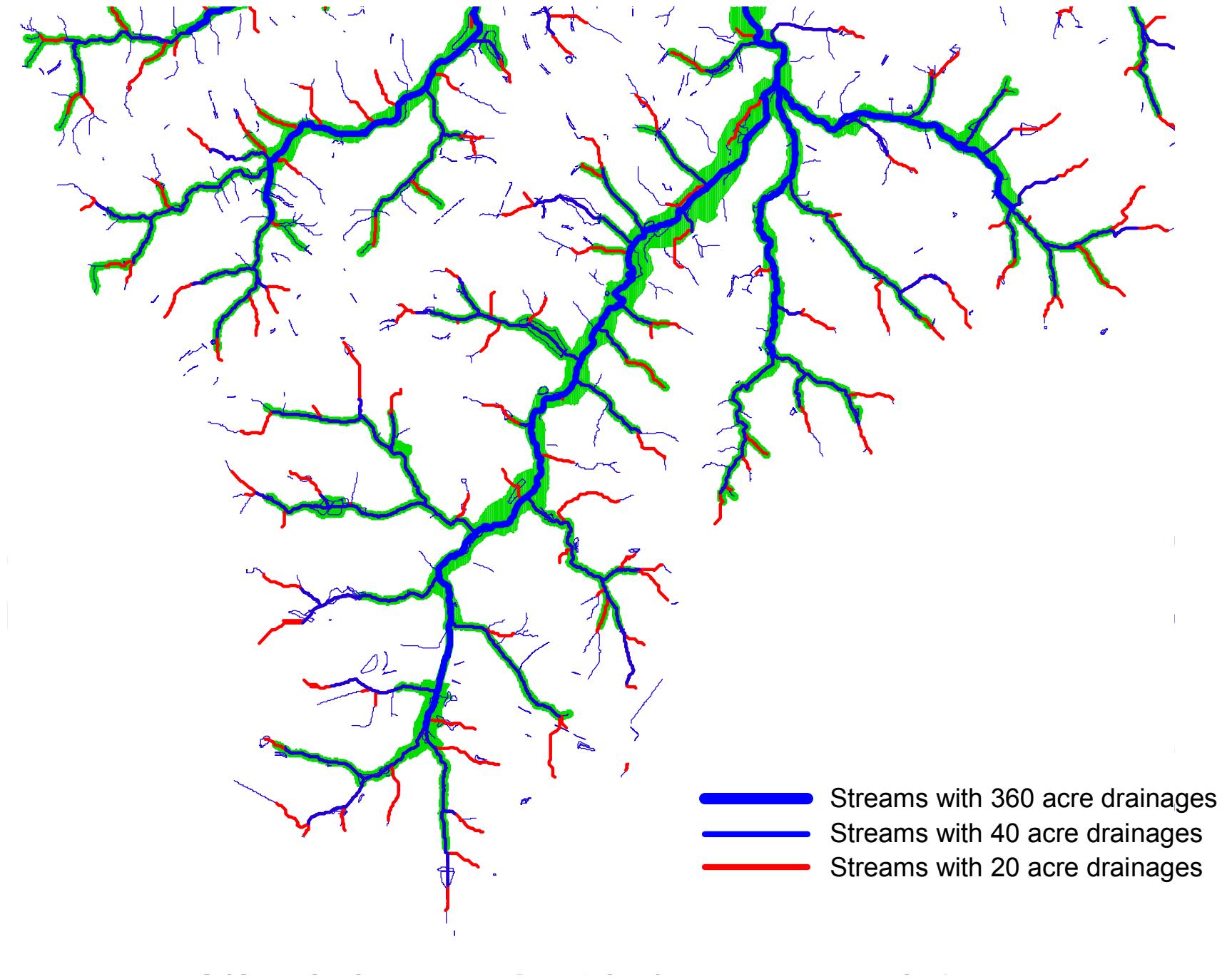
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- Interim Chesapeake Bay Preservation Area Map
  - New RPAs for surveyed watersheds
  - Estimated RPAs for watershed not surveyed
- Available on County's web at  
<http://www.fairfaxcounty.gov/dpwes>
- July 7, 2003 - CBPO adopted
- November 17, 2003 – CBPO becomes effective once final map is adopted

# Evaluation of Drainage Area









## FAIRFAX COUNTY STREAMS MAPPING PROJECT

### SUMMARY OF PILOT PROJECT AND FIRST YEAR FIELD SURVEYS

*April 28, 2003*



Stormwater Planning Division  
Department of Public Works and  
Environmental Services  
County of Fairfax, Virginia

# Contact Information

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**Stormwater Planning Division**  
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matthew.meyers@fairfaxcounty.gov

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## **Stream Mapping Project Webpage**

<http://www.fairfaxcounty.gov/gov/DPWES/Watersheds/perennial.htm>